

# **TOWN OF TEWKSBURY**



### COMMUNITY RESILIENCE BUILDING WORKSHOP

Wednesday January 22, 2019







# **WELCOME W&S**

Amanda Kohn

Steve Roy

**Lindsey Adams** 

Adria Boynton

Jaurice Schwartz





## **WELCOME CORE TEAM**

Anna McGinty

Brian Gilbert

Kevin Hardiman

Melissa Maniscalco

Stefania Gallo

Steve Sadwick

Vinnie Bomal

**Chester Cheng** 

Al Vasas

Eva Durkin

Scott Gaynor





## **WELCOME PARTICIPANTS**

Your name
Organization/Relationship to Tewksbury
Favorite thing about Tewksbury



### **WORKSHOP OUTLINE**

#### PRESENTATION:

- Overview of Science & Data
- Characterization of Hazards
- BREAK -

#### **INDIVIDUAL TABLES:**

- Identify Community Features
- LUNCH -

#### **INDIVIDUAL TABLES:**

- Identify and Prioritize Actions
- BREAK -

#### LARGE GROUP DISCUSSION:

Determine Overall Priority Actions





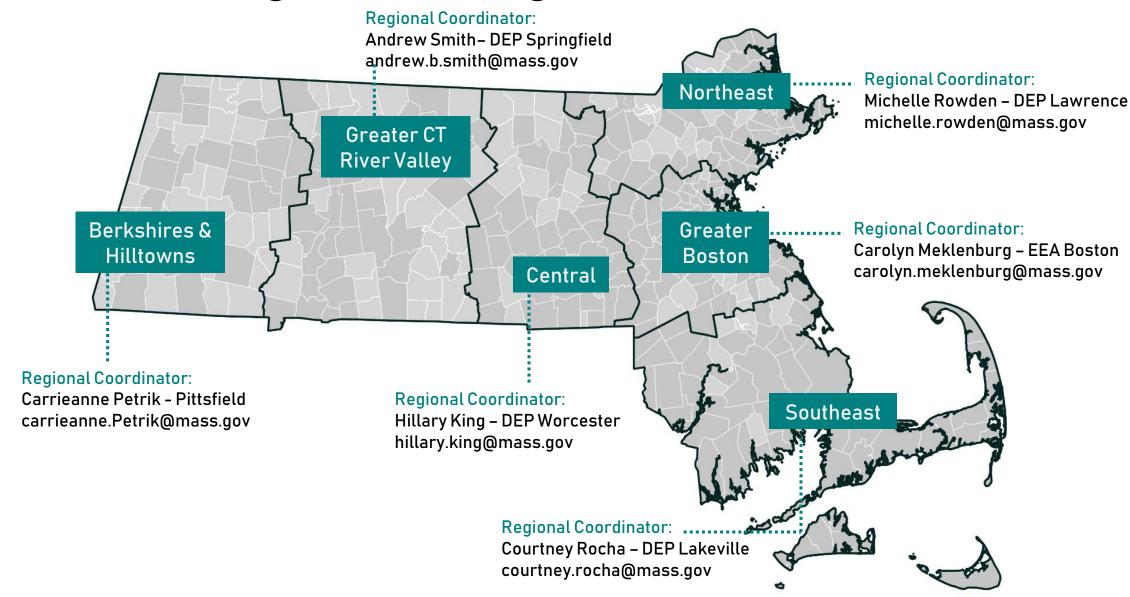
# Municipal Vulnerability Preparedness Program





Michelle Rowden,
MVP Northeast Regional Coordinator
MA Executive Office of Energy and Environmental Affairs

# MVP Regions & Regional Coordinators



# Massachusetts State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) - September 2018



 Acknowledges that climate change is already worsening natural hazards, integrating information and planning elements for 14 natural hazards that affect the Commonwealth

Uses best scientific data and projections to assess risk and vulnerability

Evaluates the Commonwealth's existing capabilities to implement agency-specific and statewide activities to reduce risk and increase resilience

# MVP Principles

### A community-led, accessible process that

- Employs local knowledge and buy-in
- Utilizes partnerships and leverages existing efforts
- Is based in best available climate projections and data
- Incorporates principles of nature-based solutions
- Demonstrates pilot potential and is proactive
- Reaches and responds to risks faced by EJ communities and vulnerable populations

#### Why nature-based?

Where appropriate, nature-based solutions can be more cost-effective, protect water quality and quantity, sustain lands that provide food and recreation opportunities, reduce erosion, and minimize temperature increases associated with developed areas and climate change.

# MVP Process/ Grant Types

Define and characterize hazards using latest science and data

Identify existing and future community vulnerabilities and strengths

Develop and prioritize community adaptation actions

Determine overall priority actions

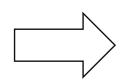
Receive MVP designation



MVP Planning Grant

### **MVP Action Grant**

Implement priority adaptation actions identified through planning process



### Three Years of MVP

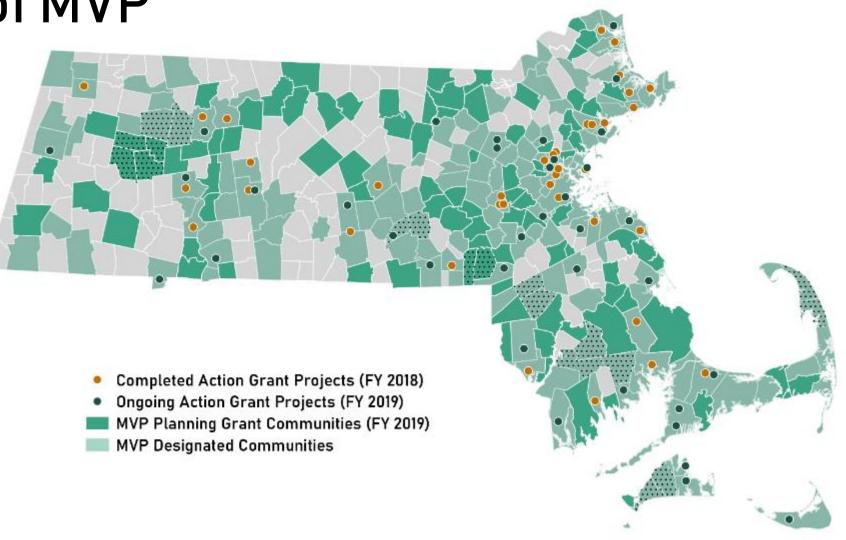
MVP Designations 71% of the Commonwealth 249 communities

**Action Grant Projects** 

FY 18: 37

FY 19: 36

Total Awards \$17M+ in planning and action grants to date



# MVP Action Grants: Project Types

- Detailed Vulnerability and Risk Assessment\*
- Community Outreach and Education
- Local Bylaws, Ordinances, Plans, and Other Management Measures
- Redesigns and Retrofits\*\*\*
- Nature-Based Flood Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques\*\*
- Nature-Based, Infrastructure and Technology Solutions to Reduce Vulnerability to Extreme Heat and Poor Air Quality



\* Most common project type

\*\* Second-most common project type

\*\*\*Third-most common project type

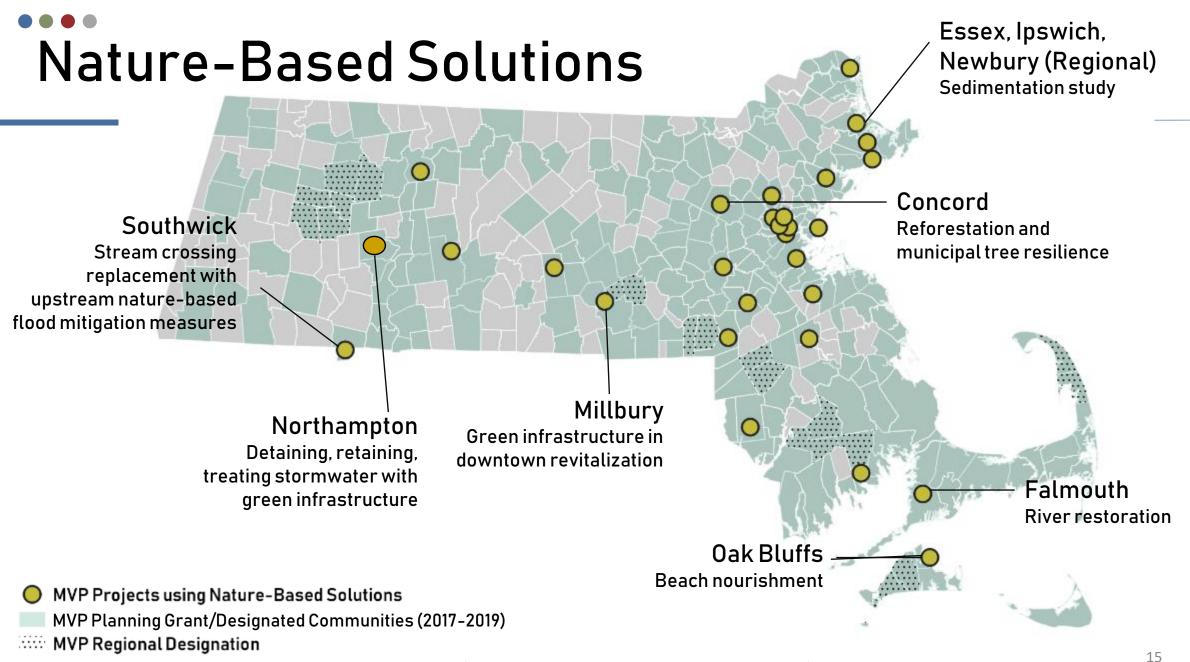
# MVP Action Grants: Project Types (cont.)



- Nature-Based Solutions to Reduce Vulnerability to other Climate Change Impacts
- Ecological Restoration and Habitat Management to Increase Resiliency

#### **NEW IN 2019**

- Energy Resilience
- Chemical Safety
- Land Acquisition for Resilience
- Subsidized Low-Income Housing Resilience Strategies
- Mosquito Control Districts
- Expanded eligibility of project location



### Example MVP Action Grant Projects

Nature-Based Flood Protection, Drought Prevention, Water Quality, and Water Infiltration Techniques

### Millbury



Utilizing green infrastructure like stormwater planters, bioretention bump outs, rain gardens, and other measures like porous pavers and pervious pavement to reduce heat island effects and stormwater runoff into the Blackstone River.



### Example MVP Action Grant Projects

Local Bylaws, Ordinances, Plans, and Other Management Measures Redesigns and Retrofits

### **Boston**



Developing its first ever resilient building code so that development in the future floodplain is prepared for at least three feet of sea level rise, the likely scenario by late century. Retrofitting a major waterfront park into a legacy park that uses nature-based solutions to address climate vulnerabilities while providing important access to recreation for residents.





### Example MVP Action Grant Projects

Redesigns and Retrofits

### Salisbury



Increasing the resilience of the neighborhood of Ring's Island by raising its access/egress roads and by improving tidal flushing through culvert replacements



### • • • • Example MVP Action Grant Projects

Nature-Based Flood Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques

### Belchertown



Designing and permitting for a replacement water storage tank that would increase storage capacity and resiliency to drought, and completing a feasibility/ concept design of a rainwater harvesting system at Belchertown High School to irrigate the athletic fields.



Next Steps: Climate Change & the Commonwealth

### Bill S.10:

# An Act for Climate Change Adaptation Infrastructure Investments in the Commonwealth

- Building on success of existing programs like MVP: Proposed new source of revenue for loans, grants, and technical assistance to municipalities and regional partnerships for priority adaptation projects
  - Proposed deeds excise increase → est.
     \$137M annually (\$1B in ten years)
  - Recurring, long-term revenue stream for multi-year project feasibility





### MA 2050 Decarbonization Plan



- EEA is conducting an <u>80x50 Study</u> to identify the strategies, policies, and implementation pathways for MA to achieve at least 80% Greenhouse Gas reductions by 2050.
- The results of that research will be published in a 2050 Roadmap report and will inform the setting of a 2030 GHG emissions limit and the development of the Clean Energy and Climate Plan for 2030.
- More information and opportunities to get involved:
- www.mass.gov/2050Roadmap







Michelle.Rowden@mass.gov https://www.mass.gov/municipal-vulnerabilitypreparedness-program



#### **Massachusetts Executive Office of Energy & Environmental Affairs (EOEEA)**

#### **Municipal Vulnerability** Preparedness (MVP)

core team -

#### Overlap

#### **United States Federal Emergency Management Agency (FEMA)**

#### **Hazard Mitigation Planning** (HMP)

planning committee

public input events



municipal leadership



provide updates on development changes







community engagement

review existing information

hazard impacts and vulnerability



document NFIP participation and compliance



abbreviated time frame





summary of findings -

state action grants





natural hazards

and in-depth

hazard profile



define the future update process



less competitive grants



identify strengths, vulnerabilities,

grant funding



background research



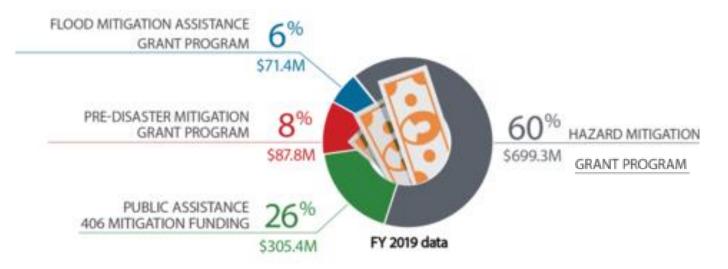
address repetitively damaged structures







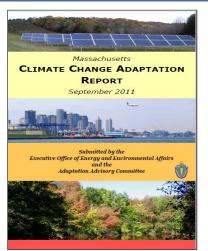


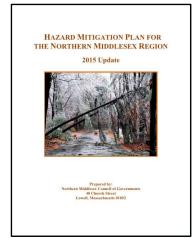






# Within Tewksbury and Massachusetts





# CLIMATE AND HAZARD DATA RESOURCES



**Massachusetts Climate Change Projections, 2018)** 

Massachusetts State Hazard and Climate Adaptation Plan, 2018

Massachusetts Climate Change Adaptation Report, 2011



Hazard Mitigation Plan for Northern Middlesex Region, 2015



US Census, American Community Survey, 2013-2017





### CLIMATE DATA SCALE

### **CLIMATE**

Regional Long Term Patterns

VS.

### **WEATHER**

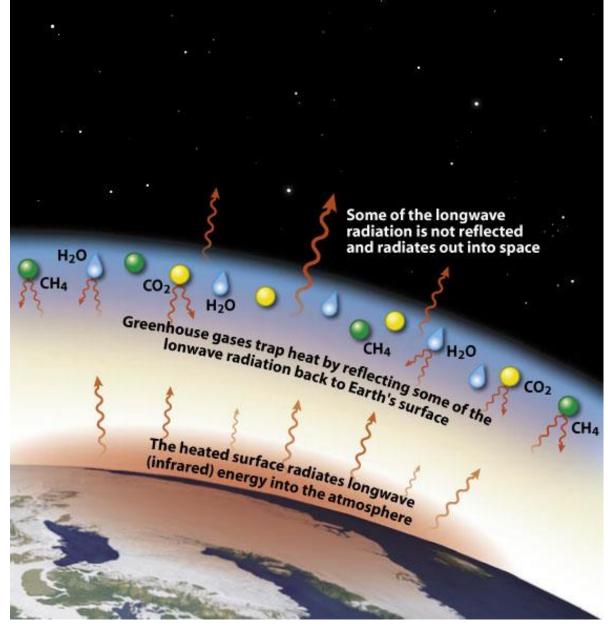
Local
Short Term Conditions

- Hyperlocal variations in climate change projections are most often within the projected margin of error of models.
- Climate data at a regional scale is most appropriate for planning. Climate projections for Massachusetts is available at the watershed and county scale.
- The resolution of climate data is not usually a limiting factor in planning. At the local scale, other factors may play a larger role.

# GREENHOUSE GASES (GHG)

- Naturally occurring
- Act as a blanket
- Examples: carbon dioxide and methane

Climate mitigation ensures there is less to adapt to and is a key component of our community's resilience



Smithsonian Environmental Research Center. "Too Much of a Good Thing." <a href="http://forces.si.edu/atmosphere/02">http://forces.si.edu/atmosphere/02</a> 04 07.html



### MA GHG GOALS

- Established by the Global Warming Solutions Act (GWSA) of 2008
- 25% reduction in GHG emissions by 2020
- 80% reduction in GHG emissions by 2050
- 1990 is the baseline year





# FIGURE 3 | TRENDS OF GROWTH IN GSP, VMT, AND POPULATION WHILE GHG EMISSIONS ARE DECREASING AND ENERGY USE HAS BEEN STABLE







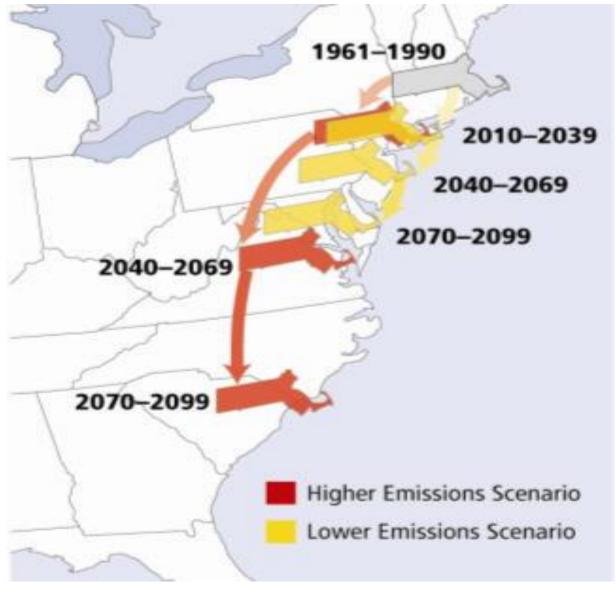


Photo: NECIA/UCS, 2007.

# **HAZARDS IN TEWKSBURY**



Extreme Temperatures





Drought, Wildfire



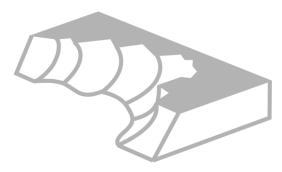
Flooding



Severe Snowstorms, Ice Storms, Nor'easters



Severe Thunderstorms, Wind, Hurricanes



Erosion, Earthquakes, Landslides





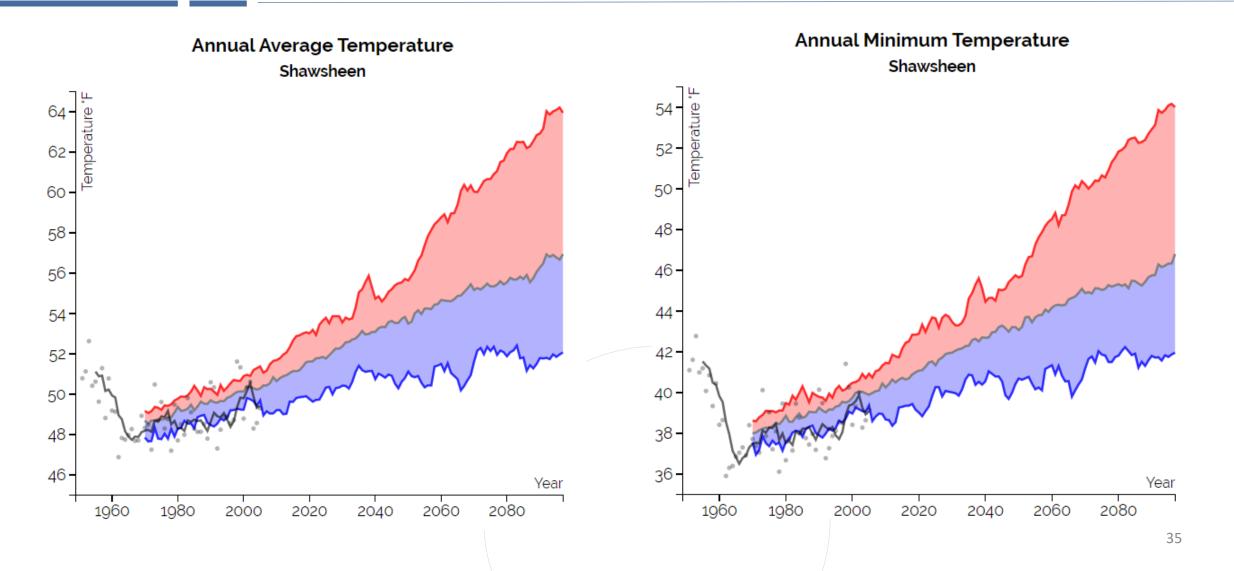
### **EXTREME TEMPERATURES**



WARMER ANNUAL AIR TEMPERATURES UP 0.5°F PER DECADE SINCE 1970, ON AVERAGE



### **EXTREME TEMPERATURES**





6

2005 **OBSERVED**  24

35

ANNUAL AVERAGE

MID-CENTURY PROJECTED ANNUAL AVERAGE

**END-OF-CENTURY** PROJECTED ANNUAL AVERAGE

DAYS WITH TEMPERATURES ABOVE 90°F

145

2005 **OBSERVED** ANNUAL AVERAGE 114

MID-CENTURY PROJECTED ANNUAL AVERAGE

101

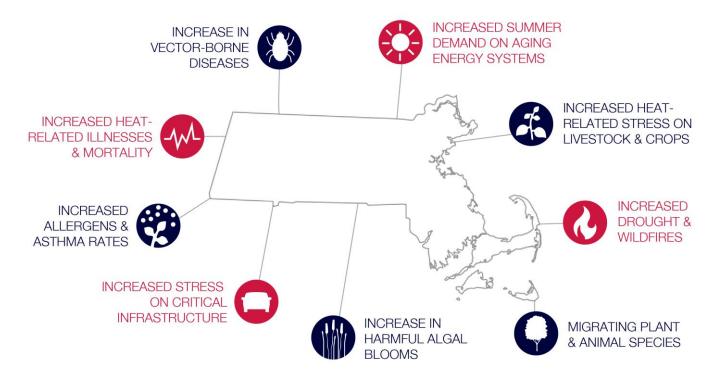
**END-OF-CENTURY** PROJECTED ANNUAL AVERAGE

DAYS WITH TEMPERATURES BELOW 32°F

#### Weston & Sampson

#### IMPACTS OF **RISING TEMPERATURES**





Massachusetts Executive Office of Energy & Environmental Affairs, 2019. "Rising Temperatures." Massachusetts Climate Change Clearinghouse. http://www.resilientma.org/changes/rising-temperatures

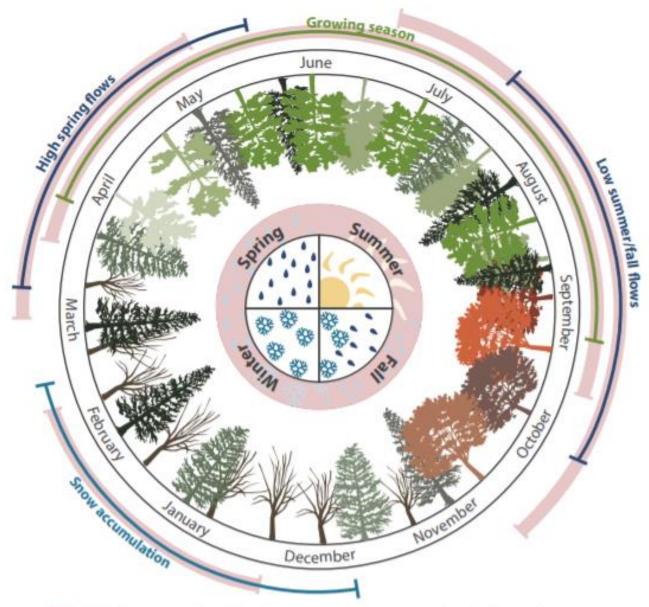
#### Tewksbury Health Department Alerts Residents after Mosquitos in Neighboring Communities Test Positive for EEE

POSTED ON: AUGUST 26, 2019 - 3:04PM

Source: Tewksbury Website, News

37

#### Northeast and Midwest seasonal patterns



Shifted season projected from increasing temperatures and precipitation changes Image credit: Northeast Climate Science Center, University of Maryland Center for Environmental Science The most notable recent drought event was in 2016



The occurrence of droughts

lasting 1 to 3 months

could go up by as much as

75% over existing conditions

by the end of the century,

under the high emissions scenario



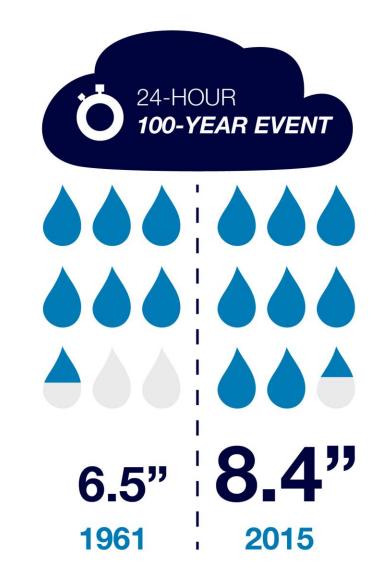


MORE INTENSE & FREQUENT EXTREME RAIN EVENTS

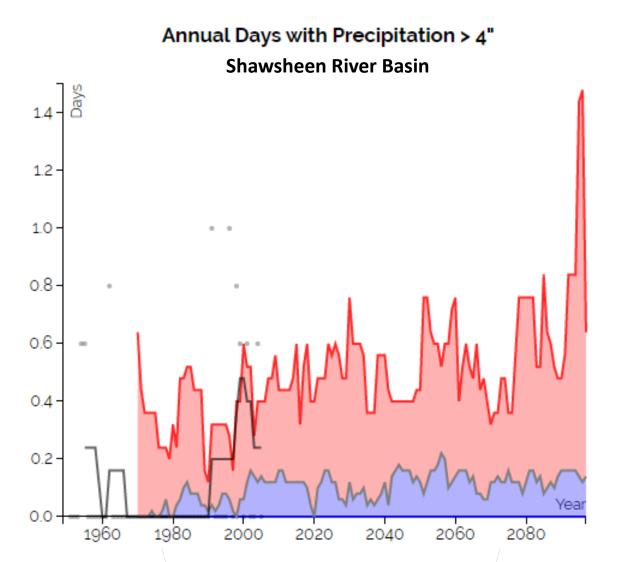
PRECIPITATION DURING HEAVY EVENTS IN THE THEAS INCREASED BY MORE THAN BETWEEN 1958-2010

#### CHANGES IN PRECIPITATION





# **EXTREME PRECIPITATION**





8%

Increase in extreme precipitation events in the northeastern U.S. by midcentury

13%

Increase in extreme precipitation events in the northeastern U.S. by 2100



ZONE	ANNUAL CHANCE	FLOODPLAIN
A, AE, A1-A30	1% ANNUAL CHANCE	100-YEAR FLOODPLAIN
X	0.2% ANNUAL CHANCE	500-YEAR FLOODPLAIN



Image at left: a portion of the FEMA Flood Insurance Rate Map (FIRM) for Tewksbury, showing the extent of the FEMA-defined 100- and 500-year floodplain

# **FLOODING**





"Areas south and east Tewksbury have experienced substantial flooding, septic system failures and nutrient loading resulting from development in close proximity to wetlands."

"The Town has initiated a project to flood proof the existing sewer manhole structures located within the 100-year floodplain."

-Tewksbury 2016 Master Plan

# AREAS IN TOWN PRONE TO FLOODING

Bridge Street and South Street

Shawsheen Street and Mohawk Street

East Street near Strong Water Brook

Pinnacle Street

Shawsheen Street Near Main Street/Route 38

Brown Street at Whipple Road

Pond Street

Bonnie Lane

Sutton Street



Photo: Pupkis Road Flooding

# STORMWATER FLOODING

#### Caused by...

Poor drainage
High amounts of impervious
surface
Undersized culverts

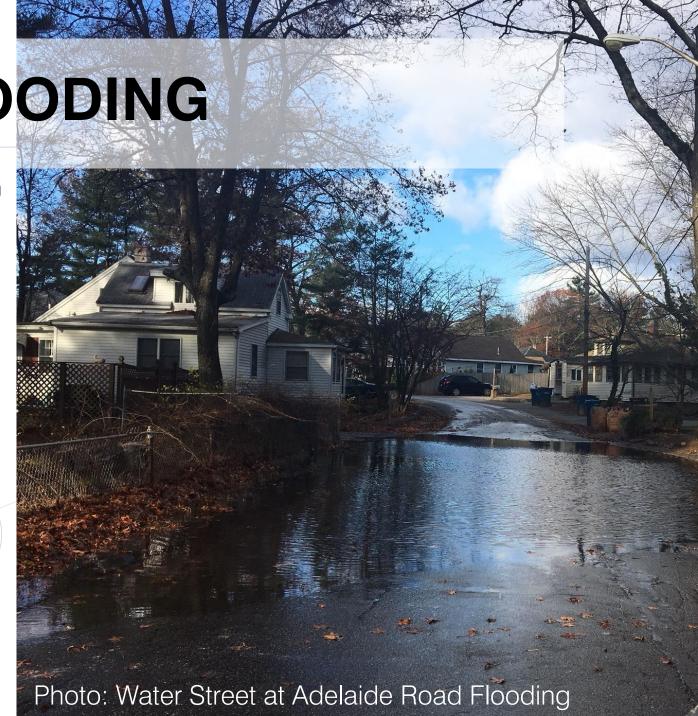
Flood-Related Culvert Work in Tewksbury

River Road at Trull Brook 31 Shawsheen Street

## **Examples of Vulnerable Areas** in Tewksbury

- Lake Street
- Pupkis near Heath
- Starr Ave at Mitchell
- Veranda St
- Water St at Adelaide Rd
- Greenwood Near Woburn Street
- Vernon Street
- Cayuga Street

- Wolcott Street at Tewmac Terrace
- Van Buren Road at Marston Street
- Dewey Street at Town Hall Avenue
- Whipple Road at Chandler Street
- Claire Street at Marie Street
- Algonquin Drive at Shawsheen Street



## **WINTER MONTHS**

The blizzard of 2013 left nearly 400,000 Massachusetts residents without power

## Rain, Warmth Close Outdoor Rink In Tewksbury

The town said in a notice on its Website that the rink would be closed "until further notice."

By Dave Copeland, Patch Staff Jan 25, 2019 3:23 pm ET

Source: Patch.com

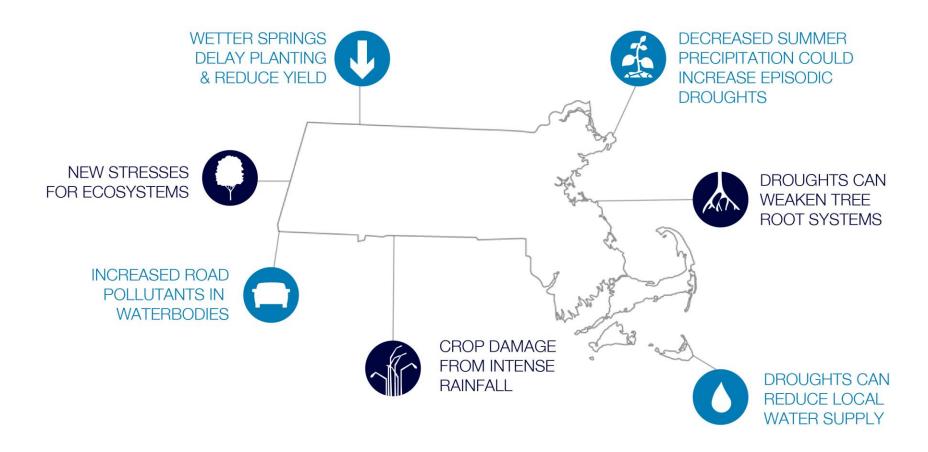
"Heavy blizzards are among the **most costly and disruptive** weather events for Massachusetts communities."



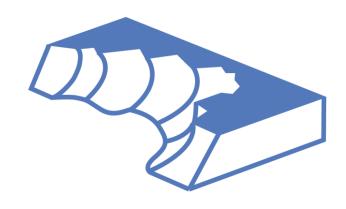


#### IMPACTS OF CHANGING PRECIPITATION



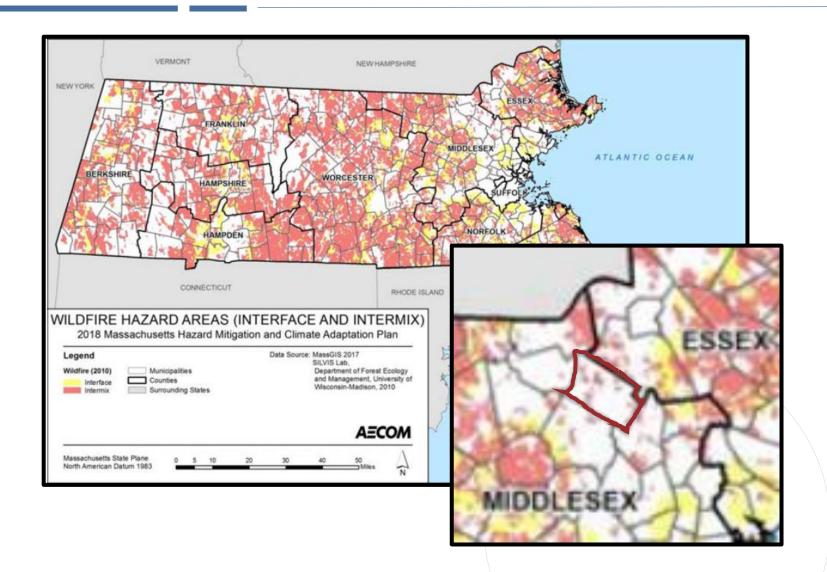


# EROSION



- Caused by riverine flow & stormwater
- Increased precipitation, including winter rains, could increase erosion₁
- Drier soils will reduce resistance to erosion

# BRUSH FIRE



#### **Moderate Risk**

Tewksbury State
Hospital
Great Swamp Area

# **HURRICANES AND EARTHQUAKES**



#### **HURRICANE**

Sandy and nor'easters

cause downed trees and power lines

Upward trend in North Atlantic hurricane activity since 1970

Nor'easters along the Atlantic coast are increasing in frequency and intensity



#### **EARTHQUAKE**

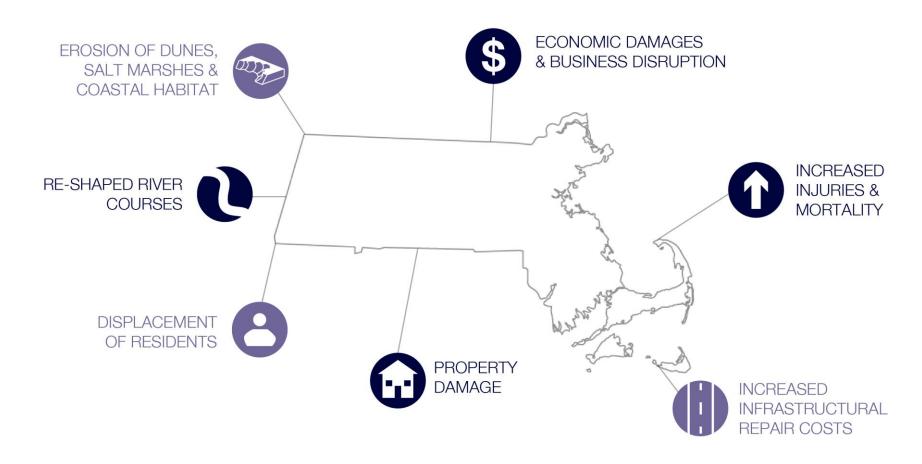
30-40

Earthquakes occur in New England each year, although most are not felt.



#### IMPACTS OF **EXTREME WEATHER**







# HAZARD POTENTIAL OF DAMS



Hazard Classification of Tewksbury Dams									
Dam Name	Impoundment Name	Hazard Class	Downstream Population						
Dams in Tewksbury									
Ames Pond Dike A	Ames Pond	High	5,000						
Ames Pond Dam	Ames Pond	High	5,000						
Ames Pond Dike B	Ames Pond	Low	5,000						

# As an FYI: Boston Sea Level Rise Projections (ft)

Increased coastal flooding

Permanently inundated low-lying coastal areas

Increased shoreline erosion

<b>Emission Scenario</b>	2030	2050	2070	2100
Intermediate	0.7	1.4	2.3	4.0
Intermediate-High	8.0	1.7	2.9	5.0
High	1.2	2.4	4.2	7.6
Extreme	1.4	3.1	5.4	10.2

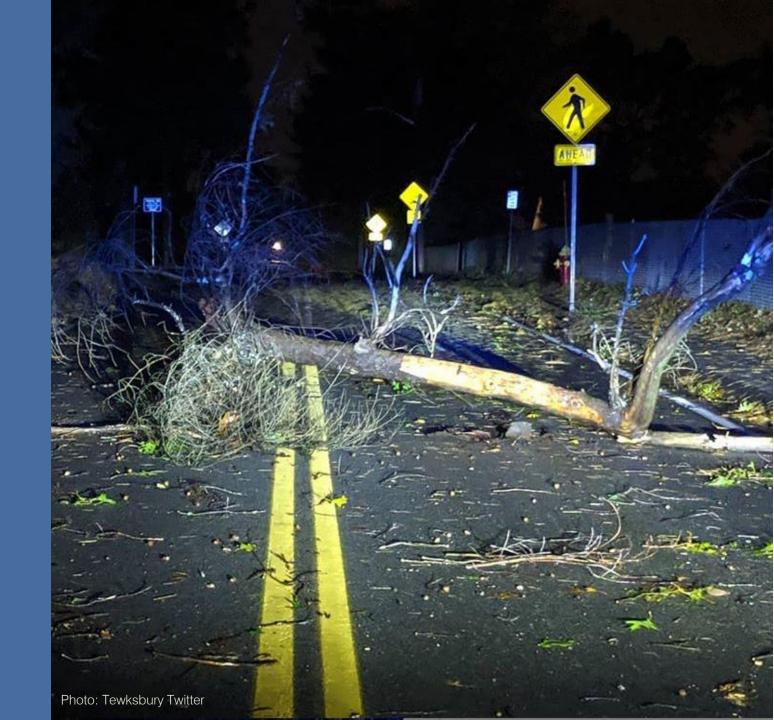
# RISK MATRIX



# **RISK MATRIX**

V = Vulnerability S = Strength	Community Resilience Bu	uilding Risk Matri	x 🔁	<b>32</b> (\$7			www.Commun			
E- Vulnerability S = Strength	I-M-L priority for action over the Sho	rt or Long term (and Ongoir	าตุโ		Top Priority Hazards	(tornado, floods, wildfire	e, hurricanes, earthqua	ke, drought, sea level	rise, heat wa	ave, etc.) Time
	= Vulnerability <b>S</b> = Strength	r or <u>s</u> ong term (and <u>o</u> ngon	·6)							
Infrastructural  Societal	l'eatures	Location	Ownershin	VorS	ł				<u>H</u> - <u>M</u> - <u>L</u>	Short Lon Ongoing
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# IDENTIFY HAZARDS



# **RISK MATRIX: HAZARDS**

Community Resilience B	uilding Risk Matr	ix 🚘 🎖	\$2 (§		www.Commun	ityResilienceBu	ilding.co	m
<b>1-M-L</b> priority for action over the <b>S</b> ho <u>/</u> = Vulnerability <b>S</b> = Strength	ort or <u>L</u> ong term (and <u>O</u> ngo			Top Priority Hazards (tornado, floods, wildfire	e, hurricanes, earthqua	ike, drought, sea level	Priority	Time
Features	Location	Ownership	V or	H I			<u>H</u> - <u>M</u> - <u>L</u>	Ongoing
Infrastructural								
Societal								
Environmental	•							•

## HAZARDS IN TEWKSBURY

#### 4 CATEGORIES FOR TODAY

Heavy Precipitation and Flooding

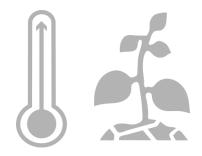




Severe Snowstorms, Ice Storms, Extreme Cold

Severe Thunderstorms, Wind, Nor'easters, Tornado





Extreme Temperatures, Drought, Wildfire



# 15 MINUTE BREAK!



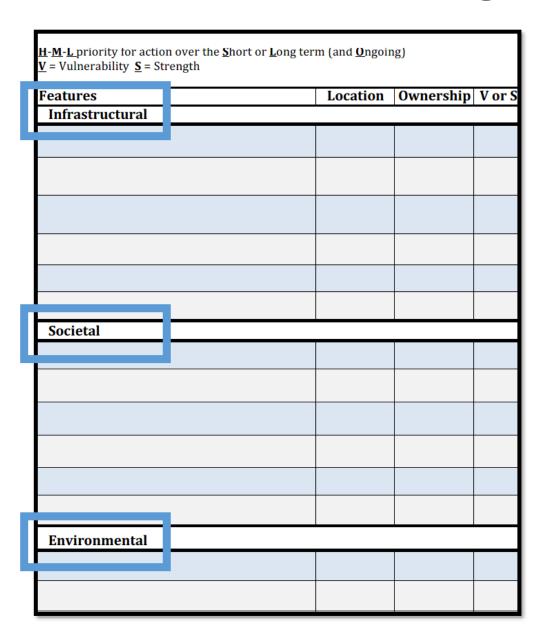
# FEATURES IN TEWKSBURY



# **RISK MATRIX: FEATURES**

Community Resilience Buildi	ing Risk Matrix	<b>34</b> (6)			www.Communi			
<u>H-M-L</u> priority for action over the <u>S</u> hort or <u>L</u>	ong term (and <b>O</b> ngoing	)	Top Priority Hazards	(tornado, floods, wildfire	, hurricanes, earthqua	ke, drought, sea level r	rise, heat wa	ave, etc.)
$\underline{V}$ = Vulnerability $\underline{S}$ = Strength			_				<u>H - M - L</u>	Short Long
Features	Location (	Ownership V or	S					<u>O</u> ngoing
Infrastructural	_							
Societal	_							
Environmental								
Liivii olilliciitai								

# **RISK MATRIX: FEATURES**



# INFRASTRUCTURAL FEATURES



Fire Department

Photo by minutemantrucks.com



**Wastewater Treatment & Collection** 



Police Department

Photo by the Northeastern MA Law
Enforcement Council







Water Supply

# INFRASTRUCTURAL FEATURES

#### CRITICAL FACILITIES

Facility Type	Common Name	Street Address	Health Facility Type	Average Daily Patient Capacity	Capacity	Feeding Capability	Emergency Generator Available
Emergency	Tewksbury Fire	21 Town				No	Yes
Operations	Department (Primary)	Hall Avenue					
Center	Tewksbury Police Department(Secondary)	918 Main Street				No	Yes
	Blair House	10 Erlin Avenue	Level 1 – 4	200		No	No
Health Care Facilities	The Emeritus	2580 Main Street	Level 4	50	No	No	
	North Fire Station	830 North Street	First Aid	0			
	Center Fire Station	21 Town Hall Avenue	First Aid	0			
	South Fire Station	2342 Main Street	First Aid	0			

Source: All Hazards Mitigation Plan. 2016. 2-6.



# **SOCIETAL FEATURES**









Population	Tewksbury	Massachusetts
2010	29,090 residents	6,547,790
2018	31,388 residents	6,902,149
Age		
Under 18 years:	19.7%	20%
65+ years:	17.5%	17%
Education		
Bachelor's degree or higher:	33.6%	42.1%
Additional Information		
Median household income:	\$93,817	\$74,167
Persons in poverty:	5.4%	10.5%
With a disability:	6.2%	7.9%
Language other than English spoken at home:	9.0%	23.1%

67

# **ENVIRONMENTAL FEATURES**



#### **Ponds**



**Rivers and Trails** 

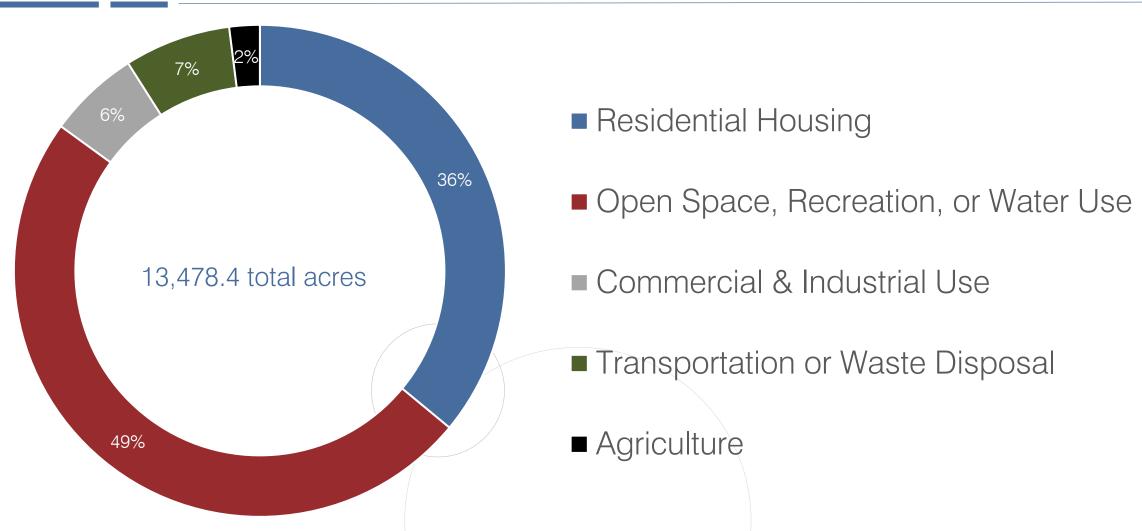
#### Tewksbury's Open Space

- 49% of the town is open space
- Open spaces include:
  - Foster Park Conservation Area
  - Mahoney Park

Shawsheen River
Merrimack River
Concord River
Ipswich River

Source: Tewksbury Open Space and Recreation Committee.

# **TEWKSBURY LAND USE**





# **RISK MATRIX: FEATURES**

FEATURES	LOCATION	OWNERSHIP	VULNERABILITY OR STRENGTH
Infrastructural	Town wide	State	Vulnerability
Societal	Multi- vs. Single- neighborhood	Town	Strength
Environmental	Specific location	Private	Both
		Shared	

# IDENTIFY FEATURES IN TEWKSBURY



# LUNCH



# ADAPTATION STRATEGIES



# **EXISTING CLIMATE ACTION**

- Participation in the National Flood Insurance Program (NFIP)
- Participation in the Community Rating System (CRS)
- Floodplain Overlay District Zoning Bylaw
- Discharges to municipal storm sewers by-law has been adopted
- Local Wetlands Protection Bylaw
- Subdivision regulations address drainage, erosion and sediment control, had have additional standards. for the floodplain district
- Green Community Designation
- Open Space and Recreation Plan addresses Natural Disaster Mitigation
- Capital Improvement Plan
- Repair of Ames Pond Dam and Dikes
- Street Sweeping Program
- DWP Forestry Department Tree Maintenance Program

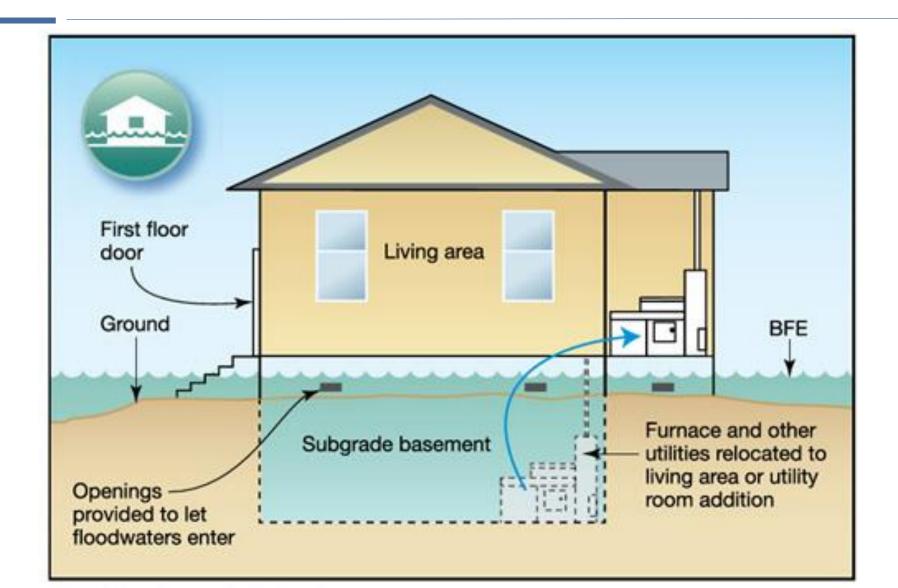
- Measures to address wildfire risk
- Groundwater Protection Overlay District
- FMA and HMGP Grants
- Enterprise fund for stormwater management
- 2017-2021 Housing production plan
- Tewksbury Master Plan
- Annual reports for community development
- Tewksbury Vision Plan
- Warrant Articles
- Complete Streets Plan
- Informal disaster SOP
- Updating Emergency Management Plan



# COMMUNITY ACTIONS



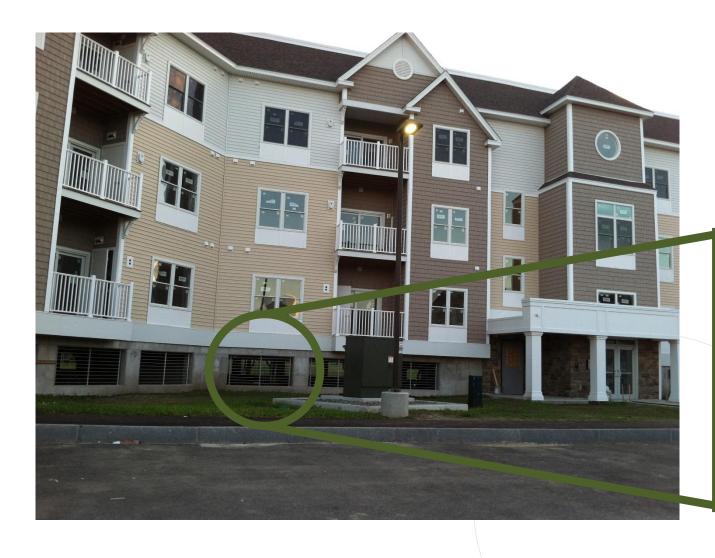
# WET FLOODPROOFING



#### PREVENTING SEWER BACKFLOW



## RAISED BUILDINGS

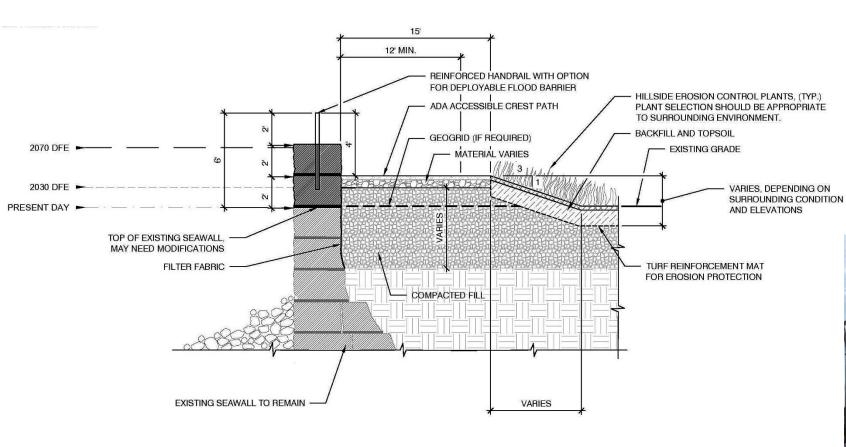




#### RETROFITTED FLOODPROOF DOORWAYS



#### FLOOD WALLS

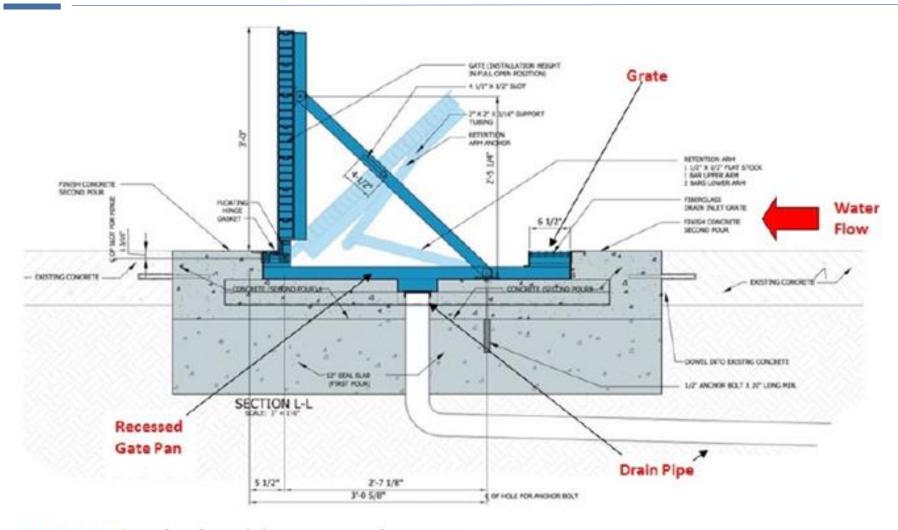




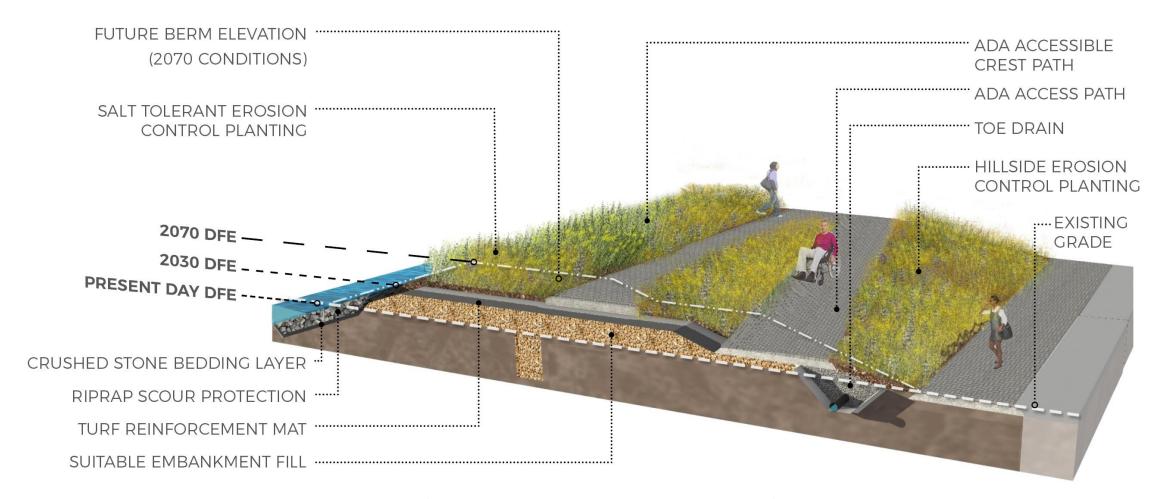


HARBORWALK BARRIER SEAWALL SAMPLE SECTION

#### DEPLOYABLE FLOOD BARRIER

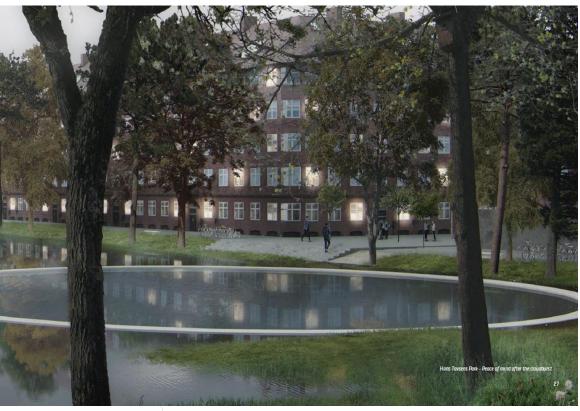


#### **VEGETATED BERM**

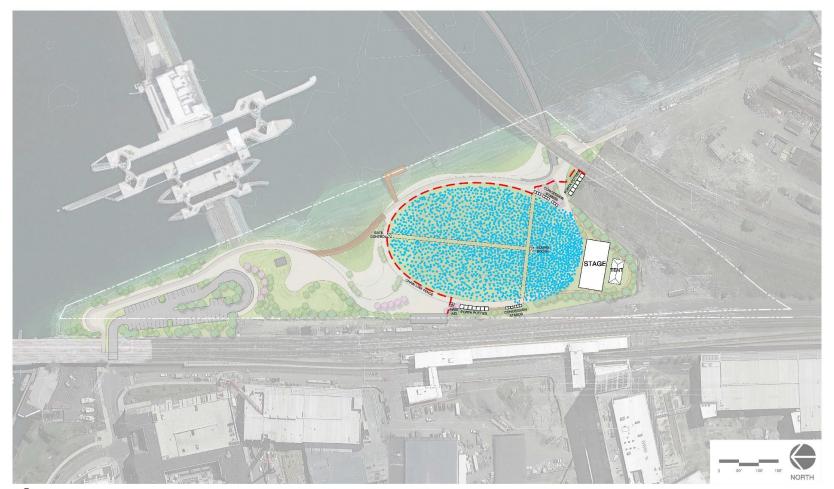


#### MULTI-PURPOSE FLOOD STORAGE





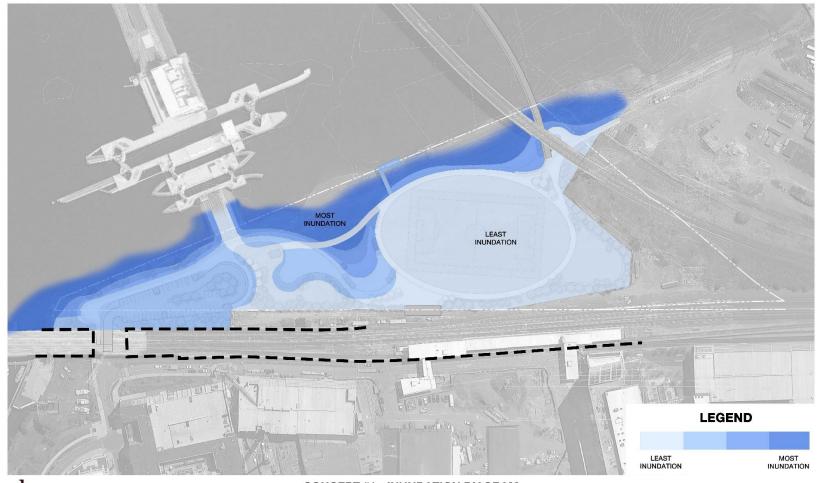
#### LANDSCAPE DESIGN TO ACCOMMODATE WATER







#### LANDSCAPE DESIGN TO ACCOMMODATE WATER



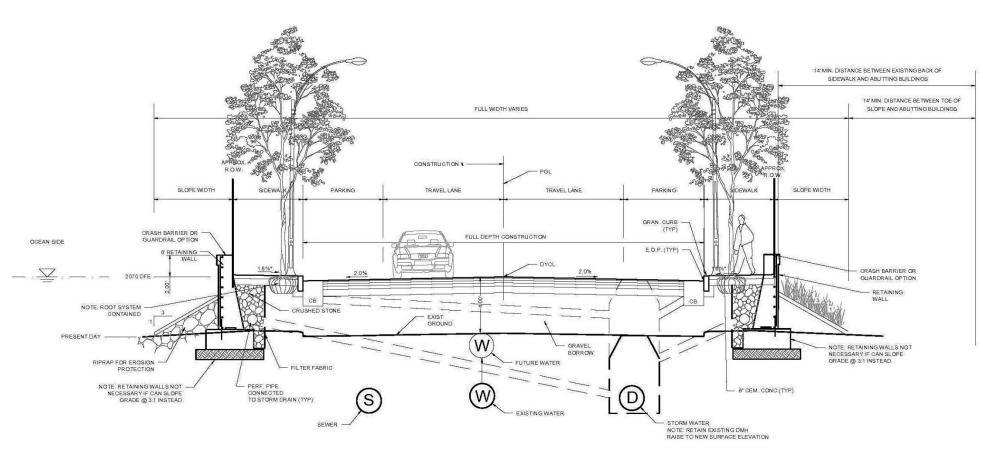




#### CULVERT WIDENING TO IMPROVE HABITAT & FLOW



### RAISED ROADWAYS



### LOW IMPACT DEVELOPMENT (LID)



Stormwater infiltration / rain gardens



Porous asphalt & permeable pavers



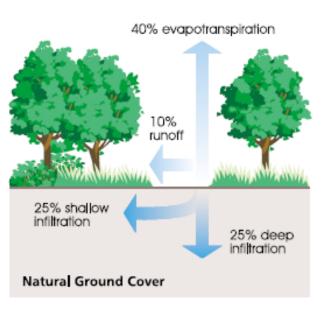
Street trees & tree box filters

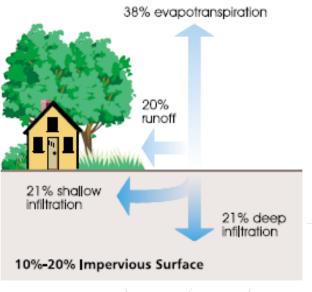
#### STORMWATER DETENTION & RETENTION

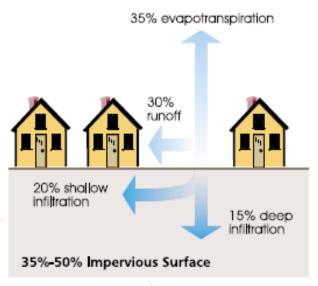


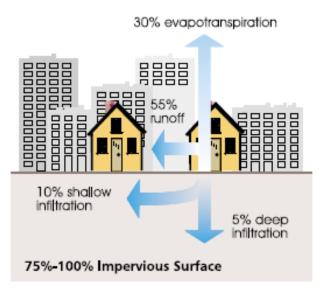


#### REDUCE IMPERVIOUS AREAS







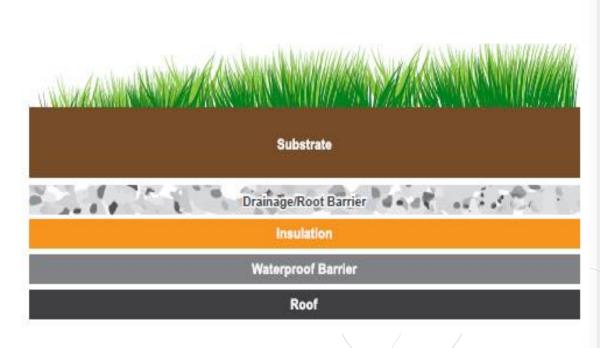


## CLOUDBURST STREETS





#### GREEN ROOFS





#### COOL ROOFS

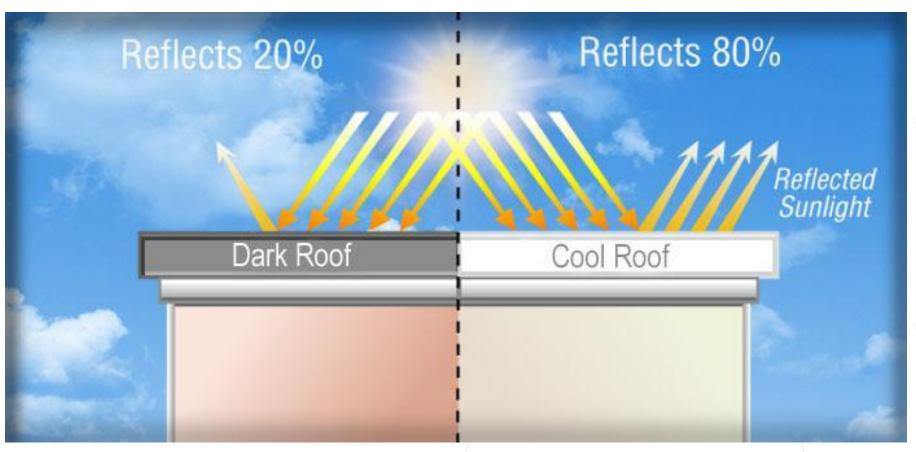


Figure 1: Dark vs. Cool Roof Surface Temperatures

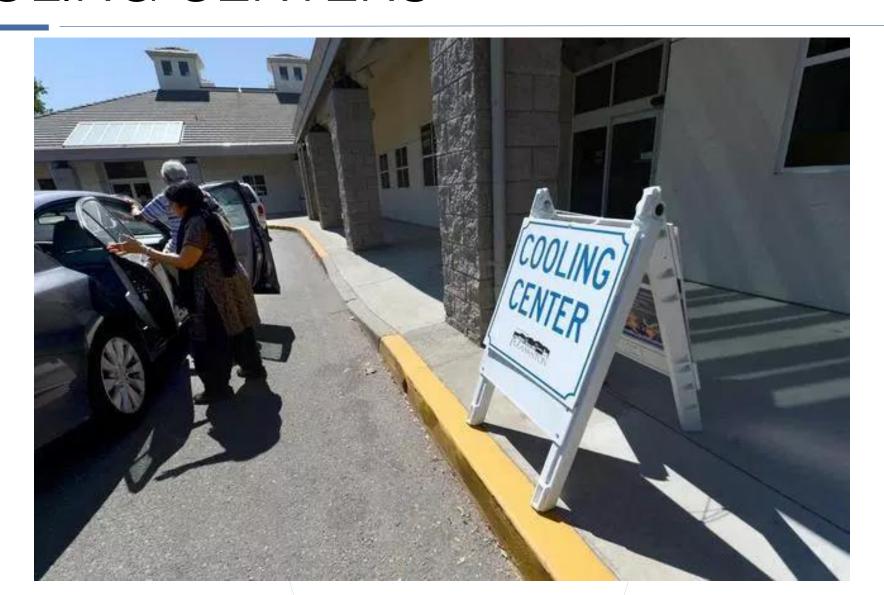
A dark roof (left) becomes much hotter than a cool white roof

Source: U.S. Department of Energy Guidelines for Selecting Cool Roofs

(right) on a sunny afternoon.

Source: Heat Island Group at Lawrence Berkeley National Laboratory

# COOLING CENTERS



## RENEWABLE MICRO-GRIDS



#### RE-EVALUATE LOCAL REGULATIONS & POLICIES

#### BROOKLINE MUNICIPAL VULNERABILITY PREPAREDNESS (MVP) ACTION PROJECT

town of brookline, massachusetts









Weston & Sampson will audit the Town of Brookline's stormwater, floodplains, zoning bylaws, public way design guidelines, wetlands bylaws, and Department of Public Works' Site Plan Review Checklist to identify opportunities to mandate higher standards for climate resiliency and to identify any conflicts these standards might we develop draft have with State policy. Our approach is centered around the promotion of naturebased solutions and strategies such as green infrastructure, low impact development (LID), open space protection, and floodplain protection. The project is funded by a Municipal Vulnerability Preparedness Action Grant from the Massachusetts Executive Office of Energy & Environmental Affairs.

Weston & Sampson will identify opportunities for incorporating standards into the develop final Town of Brookline's bylaws and other planning instruments to increase the town's resilience against the effects of climate change, including increased temperatures as well as increased precipitation frequency/intensity and associated flooding. Implementation of this project will help to reduce risk of climate change impacts to public infrastructure, private property, natural resources, and human safety and welfare. The project's specific recommendations for bylaw amendments as well as sustainability standards for site plan review will be targeted at new and renovated projects across all building sectors: residential, multifamily and affordable housing, commercial, and institutions.

Weston & Sampson's deliverables, identified as priority action items in the town's "Climate Vulnerability Assessment," will include: recommendations for new or amended town bylaws and regulations mandating LID measures. LID Best Management Practices - narrative and Site Plan Review checklist - that targets owners and developers of new and renovated residential, multifamily, and commercial properties, and assists in educating them of the overall benefits to the environment and the value in protecting their properties from climate change impacts. The standards and checklists will serve as imperative components of the "Site Plan Review" ordinance that the town will be adopting and are intended to limit storm and flood damage, mitigate stormwater runoff, reduce impervious surfaces, and improve ecosystem resiliency.

- convene a core team of leaders from departments, boards, and commissions
- review existing By-laws
- conduct literature review of examples from other
- develop and evaluate
- recommendations: workshop them with town's Boards. Commissions, and Departments.
- recommendations and assist with preparation of package to town meeting
- conduct community

Climate Action/Land Use Town of Brookline Department of Planning & Community Development mmorelli@brooklinema.gov 617-730-2670



# DEFINE COMMUNITY ACTIONS



## IDENTIFY PRIORITY ACTIONS



# 15 MINUTE BREAK!



# WRAP-UP & CLOSING REMARKS



CRB Listening **MVP-HMP** Planning Action Workshop Session Grant Plan Grant April April Summer Feb 2019 Jan 2019 2020 2020 2019





### **THANK YOU**



